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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/425,151	10/21/1999	MEI DENG	DENG-556	9154

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EXAMINER	
SHAH, CHIRAG G	
ART UNIT	PAPER NUMBER
2664	5

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/425,151	Applicant(s) DENG ET AL.	
	Examiner Chirag G Shah	Art Unit 2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 November 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,10,15-21 and 24-46* is/are rejected.

7)☒ Claim(s) *8,9,11-14,22 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 17-28, and 35 rejected under 35 U.S.C. 103(a) as being unpatentable over Galand (U.S. Patent No. 6,038,212) in view of Burdett (U.S. Patent No. 6,327,675).

Referring to claims 1, 17, and 35, Galand teaches in columns 5 and 6, a method and a system for optimally managing and rerouting of established network connections in case of network link/trunk failure. Galand discloses in figure 1 and columns 6-11, of a transmission system comprising of eight nodes being interconnected by trunks or links, along with access nodes, a route controller performing Trunk Connection Management (TCM) similar to a processing module that calculates the optimum routes through the network and a Network Topology Database (NTD that contains all the information necessary for routing, about the nodes and transmission links connected to the nodes. NTD uses a control spanning tree system for establishing and maintaining a routing tree among the network nodes and if a failure were to occur, a control message would be dispatched via spanning tree towards access nodes similarly to command nodes to trigger rerouting. Galand fails to disclose whether the node of the processing module is a control node or is a backup node when the control node is unresponsive.

Burdett teaches of fault tolerant systems, particularly communications systems having at least one redundant module. Burdett teaches in claims 1-4 and respective portions of the specification of a node such as a data communication switch that comprises of one primary processing module and one spare module capable of processing data that senses a failure of the primary module due to unresponsiveness over an interval and switches from primary module to spare module. Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Galand to include the teaching of a switching node that includes the switching from primary processing module to spare processing module for rerouting in response to a failure associated with link in order to provide a redundancy and avoid possible data losses at the failed component via link bundles.

Referring to 2-4 and 18-21, Galand teaches in columns 9 and 10 that the truck/link failure is detected by the node and due to the information contained in the node, Topology Database which is similar to a processing module, may identify all ports whose traffic is distributed by the link failure. The Topology Database includes the current number of connections originating in access node for each network trunk, and includes a means for updating the image, and detecting a network failure and identifying a trunk involved in network failure, whereby a so-called failure is being identified. It also notes the total number (N) of connections affected by the trunk failure and broadcasting N number throughout the network whereby each network access node is affected by trunk failure is being provided with (N) information as claimed. Galand teaches of broadcasting status change information. Galand fails to explicitly teach that the processing module is also designated to receive status information that includes spare capacity information from other apparatus that is connected to apparatus via ports. Burdett teaches of a plurality of

processing modules capable of processing data and handling recoverable faults. Burdett discloses in figures 1 and 2 and columns 1-3 that as illustrated that FP 16a is a primary processor and FP 16e is a spare and FP 16b-d have slots designated for spare processor, thus, when a spare is incorporated as a result of a failure, Software within the control processor could track the physical slot location since the FP are logically connected via the ports. Thus, the spare capacity information from other apparatus is connected to apparatus via ports and broadcasted to receive status change by the control processor. Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Galand to include the teachings of Burdett in order to redirect traffic to spares that would ensure that no data will be lost.

Referring to claims 24-28, Galand discloses in figure 1 and columns 6-11, of a transmission system comprising of eight nodes being incorporated by trunks or link, along with access nodes, a route controller performing Trunk Connection Management (TCM) similar to a processing module that calculates the optimum routes through the network and a Network Topology Database (NTD) that contains all the information necessary for the routing, about the nodes and transmission links connected to the nodes. Galand teaches in claims 1-7 and respective portions of the specification of generating and predefining and performing connections for rerouting to recover from network failures. Galand however fails to explicitly teach that communication module also acts in response to status change information by re-routing pre-planning process when communication deem it advisable to account for status change and where the processing module generates (and transmits to other apparatuses) a set of re-routing plans for those failures for which apparatus is a control node and to the backup apparatus. Burdett discloses in figures 1 and 2 and columns 1-3 that as illustrated that FP 16a is

a primary processor and FP 16e is a spare and FP 16b-d have slots designated for spare processor, thus, when a spare is incorporated as a result of a failure, Software within the control processor could track the physical slot location since the FP are logically connected via the ports. Burdett discloses in column 7 and claims 9-13 that control processor redirects traffic based on a failed link or status change and generates a plan and provides instruction to the back processor of the redirecting path. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Galand to include the teachings of Burdett in order to reduce latency and expedite the switch over of traffic during a failure.

3. Claims 29-34 rejected under 35 U.S.C. 103(a) as being unpatentable over Hsing (U.S. Patent No. 6,167,025) in view of Burdett (U.S. Patent No. 6,327,675).

Referring to claims 29-34, Hsing teaches apparatus for detecting faults and restoring connections in network. Hsing teaches in column 5 and figure 12 of a restoration method based on pre-planned hop-by-hop routing, the neighboring upstream switch from the failed link or node, the switch adjacent the failed link or node on the side closest to the source device, attempts to find an alternative rout to the destination device on a per virtual connection basis. Hsing disclose in column 16, 17, figures 7A and 7B and respective portions of the specification of receiving a message (reroute setup message) indicative of a change in resource at another node, the message included information re-reroute count and identifier of the switches which generated the received messages. The information denotes broadcasting of messages to other nodes regarding. Hsing further teaches in figures 14 and 17 and 18B and the respective sections of determining whether message call for a recreation of re-routing plans and initiates a process of

creating re-routing plans and transmitting rerouting plans upon their completion in process for creating, to nodes that involved in execution of re-routing plans. Hsing fails to teach of transmitting each re-routing plans to respective backup nodes and keeping re-routing plans in local storage and transmitting reroute information to each node involved. Burdett teaches of fault tolerant communication system. Burdett discloses in column 7 and claims 9-13 that control processor redirects traffic based on a failed link or status change and generates a plan and provides instruction to the backup processor of the redirecting path. Burdett also discloses of control process updates, maintains and control the state of each of processor nodes and informs the nodes that are involved in execution of the transmitted reroute plan. Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Hsing to include the teaching of Burdett in order to efficiently transmit message corresponding to change in resources and reroute plans to reduce latency.

4. Claims 5-7, 10, 15, 16, 36, and 37 rejected under 35 U.S.C. 103(a) as being unpatentable over Arslan (U.S. Patent No. 5,706,276) in view of Hsing (U.S. Patent No. 6,167,025).

Referring to claims 5-7, 10, 15, 16, 36, and 37 Arslan teaches of system for restoration of communications network. Arslan discloses in column 2, figure 1 and respective portions of the specification of a network the includes link bundles that interconnect digital crossconnect systems or Nodes. The link bundles are carried over physical spans of transmission facilities comprising a neighborhood associated with each node, where neighborhood may be different in size from a distinct neighborhood. Cross-connect systems or Nodes comprise a processing module. Arslan however fails to specifically teach of a processing module associated with each node receives information about spare capacity in neighborhood and maintains a set of re-route

plans or pointer, and receives information about a change in resource availability in neighborhood Mp that leads and processing module to conclude the a creation of re-route plans is in order. Hsing teaches in columns 4 and 5 of a an apparatus for restoring network connection. Hsing further teaches in columns 13-16 of a processing module that receives information about spare capacity in a particular and overlapping neighborhoods and maintains a set of re-route plans or pointers to such plans. The processing node in the neighboring down-stream switch node creates reroute plans whenever it receives information about a change in resource availability in a particular neighborhood. Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Arslan to include the teachings of Hsing in order to reduce the overhead associated with re-route release messages since the re-routing release message includes unique call identifiers of multiple affected failures.

5. Claims 38-46 rejected under 35 U.S.C. 103(a) as being unpatentable over Arslan in view of Hsing as applied to claims 5-7, 10, 15, 16, 36, 37 and 43-46 above, and further in view of Commerford (U.S. Patent No. 6,134,671).

Referring to claims 38-42, Arslan in view of Hsing teach of a communication network including nodes and link bundles, comprising a neighborhood associated with each node, where a node comprises a processing module that receives information about spare capacity and re-route plans. Arslan in view of Hsing fail to teach of the responsibility of recovering from failures at points of network is assigned to and distributed to different nodes of the network. Arslan in view of Hsing also fail to teach for each of a set of failure points of network is assigned for recovery purpose to a one node and to a different node as backup node, thus each node that is

a backup is adapted to direct nodes that are in the neighborhood of its associated control node to reroute traffic. Commerford teaches a method for dynamically generating restoration routes within a communication network. Commerford discloses in columns 3 and 4 of having redundant or spare real time restoration (RTR), that has an interface with one or more external control system used to create, store, and upload restoration pre-plans and provide a means for user input, such as selection of pre-plans and provide means for user display of data. RTR also receives input form a real-time topology database that contains data on the topology of network. RTR may also include a backup communication system with DXC that may be used to communicate with each DXC in the event that primary communications fail, automatically shifting to the backup communication for each node. Therefore, it would have been obvious to one of ordinary skills in the art to modify the teachings of Arslan in view of Hsing to include the teaching of placing an RTR in each neighborhood in order to restore reliably, efficiently, and cost effectively restore communication within a network or a neighborhood after a network outage as occurred.

Referring to claims 43-46, Arslan in view of Hsing teach of a communication network including nodes and link bundles, comprising a neighborhood associated with each node, where a node comprises a processing module that receives information about spare capacity and re-route plans. Arslan in view of Hsing further teach that upstream neighboring switches are generally responsible for initiating the process of establishing an alternative path to the destination while downstream neighboring switches are generally responsible for initiating the release of network capacity reserved by switches which are no longer used as part of the path to communication information. Arslan in view of Hsing, however fail to explicitly disclose of a

control node responsible for each neighborhood to re-routing plan for failures that might occur to its neighborhood with a re-routing plan created by the control node. The re-routing plan comprises set of subject-node re-routing plans and control node transmits these plans to neighborhood to execute these plans during a outage. Commerford discloses in columns 3 and 4 of having redundant or spare real time restoration (RTR), that has an interface with one or more external control system used to create, store, and upload restoration pre-plans and provide a means for user input, such as selection of pre-plans and provide means for user display of data. Commerford further discloses that RTR receives real-time topology (RTT) database as discussed before. Commerford also discloses in figure 3 and respective portions of the specification that RTR is comprises of four main process components which are an RTR manager, a restoration control, a network control, and a reporting component. Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Arslan in view of Hsing to include the teaching of Commerford that would enable execution of pre-plan routes developed by a control node in order to ensure that all neighborhood are able to generate restoration routes via control nodes following an outage.

Allowable Subject Matter

6. Claims 8, 9, 11-14, 22, and 23 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitation of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Or faxed to:

(703)305-3988, (for formal communications intended for entry)

Or:

(703)305-3988 (for informal or draft communications, please label "Proposed" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chirag G Shah whose telephone number is 703-305-5639. The examiner can normally be reached on M-F 7:30 to 4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 301-305-4366. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

cgs
March 17, 2003

Ajit Patel